REMARKS

On May 25, 2005, Applicant filed an Appeal Brief. The Examiner did not file an answer to this Appeal Brief, but, instead, issued a new Office Action on August 5, 2005. In this new Office Action, the Examiner, for the first time, rejected the pending claims as not being enabled under 35 U.S.C. § 112, first paragraph. The rejections under 35 U.S.C. § 103(a) contained in the outstanding Office Action are identical to those asserted in the September 28, 2004 Final Office Action.

Accordingly, the status of pending claims 5-7 and 10-13 is:

- Claim 5-7, 10, 12 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Plester in view of Denholm or Liebert;
- Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Plester in view of Denholm as applied to claims 5-7, 10, 12 and 13 in further view of Hayashi, or, alternatively, over Plester in view of Liebert as applied to claims 5-7, 10, 12 and 13 in further view of Hayashi; and
- Claims 5-7 and 10-13 stand rejected under 35 U.S.C. § 112, first paragraph, as not being enabled.

For at least the following reasons, Applicant respectfully traverses these rejections.

A. The Art Cited in the Examiner's 35 U.S.C. § 103 Rejections Fail to Teach or Suggest Each Element of the Rejected Claims[1]

Applicant respectfully submits that the Examiner's combination of references is improper as the Examiner has failed to articulate a credible basis for combining the teachings of the cite art as advanced in the outstanding Office Action. Applicant further asserts that, even if combined as

[1] Applicant's Remarks contained herein regarding the Examiner's rejections under 35 U.S.C. § 103(a) are substantially the same as contained in the Applicant's Appeal Brief. Nevertheless, Applicant incorporates by reference the argument in the Appeal Brief as if fully set forth herein.

suggested by the Examiner, the combination of cited art fails to teach or suggest an apparatus as recited in claim 5.

1. **The August 5, 2005 Final Office Action**

Regarding the Plester reference, the Examiner asserts that

> Referring to Figures 1 and 2, page 8, line 19-page 9, line 12, and page 10, line 2-page 13, line 17, Plester discloses an apparatus for modifying a surface of a container made of a polymeric compound comprising: a reception chamber 1 adapted for receiving the container 2 while keeping airtightness; a vacuum pump for evacuating the reception chamber 1 (pg 11, line 35-page 12, line 2); a plasma generating unit 6 for generating plasma in the reception chamber 1 (pg 10, lines 11-13); an electrode 3 adapted for being inserted into the container 2 received in the reception chamber 1 (pg 10, lines 11-16); and a high voltage power source 6 for applying high voltage to the electrode (pg 10, lines 11-16); wherein an interior side surface layer of the container received in the reception chamber is modified into a material that is not permeable (pg. 9, lines 3-12, pg. 13, lines 4-17, and claims 28-29).
>
> Regarding the claim limitation of a material that is not permeable by carbon dioxide gas and oxygen or a material that is hard to be permeated by carbon dioxide gas and oxygen, it should be noted that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963). Thus, since the interior side surface layer of Plester is an inert or impermeable material, the apparatus of Plester is capable of not being permeated by or hard to be permeated by carbon dioxide gas and oxygen.

(Office Action at p. 3-4).

The Examiner acknowledges, however, that Plester fails to teach applying high voltage positive pulses to the electrode and an apparatus that implants ions into an interior side surface of the container. (Office Action at p. 4). To overcome this deficiency in Plester, the Examiner separately relies on Denholm and Liebert. With respect to the teachings of Denholm and Liebert, the rejection states:

> Referring to column 4, line 3-column 5, line 40 of Denholm et al. or column 4, lines 50-57 and column 5, lines 12-33 of Liebert et al., Denholm et al. or Liebert et al. discloses an apparatus that applies high voltage positive pulses to an electrode inside of the chamber in order to accelerate (implant) ions into the substrate with the desired depth and dose of impurity material (col. 4, lines 33-38 of Denholm et al., col. 5, lines 22-30 of Liebert et al.). Additionally, since it is well established in the art that a substrate is merely the material that is processed or worked upon by the apparatus, the substrate in the instant application is simply the interior side surface of the container. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply high voltage positive pulses to the electrode inside of the container of Plester as taught by Denholm et al. or Liebert et al in order to accelerate ions into the interior side surface of the container with the desired depth and dose of impurity material.

(Office Action at p. 4-5). For at least the following reasons, Applicant respectfully disagrees.

2. <u>There is No Credible Motivation to Combine the Cited References</u>

To overcome the admitted deficiencies in Plester, the Examiner separately relies on the teachings of Denholm and Liebert. Plester relates to a method of coating the inner surface of a container by use of a metal gas tube 3. (*See* Fig. 1). Denholm relates to a method of treating a wafer surface, *e.g.*, a semiconductor chip, by causing ions to impact a surface of the wafer. (Abstract, col. 1, lines 18-37; Fig. 1). Similarly, Liebert relates to a doping apparatus for semiconductor chips. (Abstract; Fig. 1). The Examiner's asserted motivation for this combination of references is "to apply high voltage positive pulses to the electrode inside of the container of Plester as taught by Denholm et al. or Liebert et al. in order to accelerate ions into the interior side of the surface of the container with the desired depth and dose of impurity material." (Office Action at p. 5). The Examiner, however, does not identify where this alleged motivation can be found in any of the cited references.

To establish a *prima facie* case of obviousness, three basic criteria must be met:

1. there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
2. there must be a reasonable expectation of success; and
3. the prior art reference (or references when combined) must teach or suggest all the claim limitations.

(MPEP 2143). The teaching or suggestion to make the claimed combination must be found in the prior art, not in Applicant's disclosure. (*In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); MPEP 2143.)

Here, the Examiner has impermissibly combined references based on a alleged motivation that can come only from the Applicant's disclosure. The Plester reference is directed to a method of coating the interior of a container to provide enhanced barrier properties. (*See* pp. 3-6). As Plester envisions these containers to be used in food and beverage applications (*see* pp. 1-3), those of ordinary skill in the art would understand that there is no particular need to achieve exceedingly uniform coatings. Indeed, there is no mention of any problem associated with the uniformity of coatings mentioned in Plester. Thus, the Examiner's asserted motivation for modifying Plester according to Denholm or Liebert does not come from the prior art, but is, instead, an unsupported assertion used to justify the otherwise hindsight reconstruction of the Applicant's invention.

Indeed, the Examiner's asserted motivation is contradicted by the express teachings of Denholm. In Denholm, it is taught that "[g]ood treatment uniformity is obtained by keeping the gas density in the region 34 between the manifold [32] and the workpiece 14 as uniform as

possible." (Col. 4, lines 19-21). This uniformity of gas density is achieved by providing a manifold 32 that is circular in plan and has an array of openings. (Col. 4, lines 21-25). However, modifying the Plester apparatus according to the teachings of Denholm would fail to result in a uniform gas density near the interior surface of the container as required by Denholm due to the irregularity of container 2 in relationship to gas tub 3. (*See* Plester Fig. 1). Thus, while Denholm suggests uniform treatment of the surface of a semiconductor chip (a notably distinct technological field from food and beverage containers), combing the references as asserted by the Examiner would destroy the uniformity of gas density required by Denholm and, thus, the Examiner's motivation of ion implantation of "the desired depth and dose of impurity material" would not be achieved even if the references are combined as suggested by the Examiner.

Further, one embodiment of Denholm includes an ultraviolet light source 102 that allows ultraviolet light to pass between manifold 32 and platen 30 by entering the chamber through a window 104. (*See* Fig. 1A; col. 5, lines 52-60). To modify the Denholm apparatus so that manifold 32 was located inside a container while platen 30 was outside the container would impermissibly destroy this key embodiment.

3. The Examiner's Suggested Combination of Prior Art Fails to Teach of Suggest each Element of Claim 5

Applicant's invention involves the ***modification*** of the interior surface of the container, as opposed to ***coating*** the container. For example, Applicant's specification states:

> In this embodiment, ions are implanted thus into the whole area of the interior side surface of the PET container 2. Accordingly, the material itself of the interior side surface of the PET container 2 originally containing carbon are modified into DLC (diamond-like carbon) throughout (see Fig. 4). That is, in this embodiment, the original surface of the PET container 2 is not coated with DLC

> but the material itself of the surface of the PET container 2 is modified into DLC so that a DLC layer 22 is formed all over the interior side surface as shown on the right of Fig. 4.

(Specification at page 13). *See also* Applicant's specification at page 26, line 23 to page 27, line 2. Applicant's claim 5 as amended recites the feature of ***modifying*** the interior side surface of the container through ion implantation. Plester, on the other hand, certainly does not teach or suggest this feature.

The grounds of rejection do not assert that the system for forming an inert/impermeable surface disclosed in Plester actually ***modifies*** a portion of the inside of the container being treated. Indeed, Plester emphasizes ***coating*** the inside surface of the container. (*See, e.g.*, Plester at page 5, lines 10-27; page 7, lines 16-24; page 12, lines 29-32.)

Clearly, therefore, Plester does not teach or even hint at a device that implants ions into the interior side surface of the container so as to modify the interior side surface, as recited in the claim 5. To the contrary, the objective of Plester is to deposit a thin polymer ***coating*** on the surface (*see, e.g.,* the abstract). Plester explains that the internal surface of the container is changed by surface reaction or surface activation (*see* page 13, lines 4 to 17). However, Plester makes clear that "free radicals formed thereby are induced at the inner surface of the container before the reactant gases are introduced. After cleaning and surface activation ... provides in situ plasma assisted polymerization." (Plester at p. 10, line 23 to page 11, line 4). This means, surface activation is induced before the coating. However, there is no description that the inner surface of the container is modified into a material that is not permeable through surface activation. Rather, referring to p. 11, lines 5-14 of Plester, the polymer ***coating*** makes the

material non-permeable. Moreover, in making the material non-permeable, there is no suggestion in Plester of implanting ions as recited in claim 5.

Further, neither Denholm nor Liebert can implant ions to the interior side surface of the container even if a container is disposed on a plate. In the ordinary plasma density as used in Denholm and Liebert, since the normal diameter of the mouth of the PET container is not larger than 2 cm, the plasma outside of the PET container cannot connect to the interior side thereof. That is, even if the positive high voltage is applied to the positive electrode, the positive high voltage is not applied to the plasma in the interior side of the PET container. Thus, neither Denholm nor Liebert cannot implant ions to the interior side surface of the container.

Still further, in Plester, the electrode inserted into the container merely generates plasma by discharging supplied RF power. That is, Plester does not teach or suggest applying high voltage pulses to the electrode so as to make the plasma in the interior side of the container into positive high voltage. Thus, Plester cannot implant ions to the interior side surface of the container.

Thus, Applicant submits that Plester in view of Denholm or Liebert does not teach or suggest inserting the electrode to which the positive high voltage pulses are applied so as to change the plasma in the interior side of the container. That is, Plester in view of Denholm or Liebert cannot "implant ions to the interior side surface of the container" as recited in claim 5 of the application.

Claims 6-7, 10 and 12-13 depend on claim 5 and are therefore patentable for at least the reasons presented above with respect to claim 5. In view of the foregoing distinctions, Applicant respectfully request the Board to withdraw the rejection of claims 5-7, 10 and 12-13. As claim

11 depends on claim 5, and as the Hayashi reference fails to cure the deficiencies of Plester, Denholm and Liebert discussed above with respect to claim 5, Applicant submits that claim 11 is patentable over the cited references at least based on this dependency.

B. The Applicant's Claim are Enabled

In the August 5, 2005 Office Action, the Examiner, for the first time, rejected claims 5-7 and 10-13 as failing to comply with the enablement requirement of 35 U.S.C. § 112, first paragraph. For at least the following reasons, Applicant respectfully traverses this rejection.

The Examiner alleges that "since argon is such a chemically unstable atom, it is impossible for argon to bond with another atom, and thus implanting argon ions into the container is not enabled." (Office Action at p. 2). Applicant, however, respectfully disagrees. Applicant respectfully submits that Applicant's claims are enabled.

As the Examiner points out, argon does not bond with the molecular structure of the resin. However, at the time of implanting, the implanted argon remains embedded between the resin molecules. Generally, when ions are implanted, it is called "implanting ions" (or ion implantation) by those of ordinary skill in the art whether or not the implanted ions are bonded with another atom.

Indeed, ion implantation such as described in Applicant's specification and as recited in Applicant's claims is known in the art. The references cited in the concurrently filed Information Disclosure Statement, *i.e.*, U.S. Patent No. 5,970,366 (which corresponds to JP-A-32210), U.S. Patent No. 5,695,827, U.S. Patent No. 5,912,697, and the Japanese-language article entitled "*Ion Implantation Into Polymer Material*" (translation included), each describe ion implantation as

being a technique that is known to those of skill in the art. Accordingly, Applicant respectfully submits that each of claims 5-7 and 10-13 is enabled.

CONCLUSION

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Brandon M. White
Registration No. 52,354

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: December 5, 2005